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**BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES**

Application Number: 10/664,792  
Filing Date: September 16, 2003  
Appellant(s): CHOI ET AL.

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Jeanette S. Harms  
For Appellant

**EXAMINER'S ANSWER**

This is in response to the appeal brief filed August 13, 2008 appealing from the Office action mailed March 3, 2008.

**(1) Real Party in Interest**

A statement identifying by name the real party in interest is contained in the brief.

**(2) Related Appeals and Interferences**

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

**(3) Status of Claims**

The statement of the status of claims contained in the brief is correct.

**(4) Status of Amendments After Final**

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

**(5) Summary of Claimed Subject Matter**

The summary of claimed subject matter contained in the brief is correct.

**(6) Grounds of Rejection to be Reviewed on Appeal**

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

**(7) Claims Appendix**

The copy of the appealed claims contained in the Appendix to the brief is correct.

**(8) Evidence Relied Upon**

Logvinov et al (U.S. Pub. No. 2003/0231582)

Dollard (U.S. Pat. No. 6,934,340)

Goldstein et al (U.S. Pub. No. 2004/0081076)

### **(9) Grounds of Rejection**

The following ground(s) of rejection are applicable to the appealed claims:

#### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. § 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-3, 5, and 6 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Logvinov et al (U.S. Pub. No. 2003/0231582 – previously cited; "Logvinov") in view of Dollard (U.S. Pat. No. 6,934,340 – previously cited).

Regarding claim 1, Logvinov discloses a method of improving receiver performance by creating an improved channel estimate by carefully inserting pilot tones into sub-channels (¶ 0016). Logvinov discloses the notoriously known fact that, in an OFDM communication system (¶ 0003), pilot signals are utilized "in particular sub-channels" to determine channel estimation (¶ 0011). Logvinov does not disclose generating a pilot mask for immediate data communication use in the receiver based solely on analysis at the receiver, wherein the pilot mask includes a set of flags, the set of flags associated with certain sub-channels, wherein each flag in the set of flags determines whether its associated sub-channel is usable for pilot tracking, wherein at least one flag indicates its associated sub-channel is not usable for pilot tracking, thereby allowing the receiver to avoid a bad pilot. However, Dollard teaches, in a strictly analogous channel improvement technique for OFDM (col. 5, lines 30-40), determining a sub-channel mask or "bitmap indicative of which sub-carriers are usable and unusable" (col. 5, lines 45-55) at a first transceiver (i.e. comprising a first receiver). Each "bit" in

Dollard's "bitmap" reads upon the claimed "flag". That is, the on or off state of bits in Dollard's bitmap corresponds to a usable or unusable state of a respective sub-carrier in the OFDM transmission system. The first instance of Dollard's mask is generated based solely upon an analysis at the first transceiver communication device (col. 5, lines 40-45; i.e. the claimed first receiver). Although Dollard discloses the generation of a mask or "bitmap" which is "negotiated" (col. 6, lines 5-15) between two transceivers, the initial version of the mask is, indeed, generated according to an analysis at a "first communication device" only (col. 5, lines 40-45). That is, the first instance of the mask is created based upon an analysis performed at the first communication device without any assistance from another device. Furthermore, as broadly as claimed, this mask is generated "for immediate data communication use" in because it is immediately transmitted to a second transceiver, as data, to determine a negotiated mask in conjunction with the transmitter. Finally, in a proposed combination of Dollard in view of Logvinov, the selection of certain sub-carriers which are usable or unusable according to Dollard's "bitmap" in the OFDM communication system of Logvinov would, as understood by one having ordinary skill in the art, apply to the position of pilot symbols in the OFDM transmissions because no pilots would be inserted into a sub-carrier that is specified as "off" in the bitmap. Therefore, Dollard's bitmap would indicate sub-channels which are not usable for pilot tracking, thereby allowing the receiver to avoid a bad pilot. Therefore, it would have been obvious to one having ordinary skill in the art at the time which the invention was made that the OFDM communication system of Logvinov could be modified to apply a mask of usable and unusable sub-channels as taught by Dollard because it would further aid in the perfection of the channel for communication.

Regarding claim 2, Logvinov in view of Dollard disclose the limitations of claim 1 as applied above. Further, Dollard discloses that if a spur or interference coincides with a sub-channel, then the pilot mask will not allow that sub-channel to be used (col. 7, lines 17-60, col. 8, lines 35-42).

Regarding claim 3, Logvinov in view of Dollard disclose the limitations of claim 1 as applied above. Further, Dollard discloses the remaining limitations of the claim as applied to claim 2 above.

Regarding claim 5, Logvinov in view of Dollard disclose the limitations of claim 1 as applied above. Further, as broadly as claimed and as understood by one having ordinary skill in the art, the combination of Logvinov in view of Dollard would perform equally well at any data rate.

Regarding claim 6, Logvinov in view of Dollard disclose the limitations of the claim as applied to claim 1 above.

3. Claim 4 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Logvinov in view of Dollard, and in further view of Goldstein et al (U.S. Pub. No. 2004/0081076; "Goldstein").

Regarding claim 4, Logvinov in view of Dollard disclose the limitations of claim 1 as applied above. Further, Dollard discloses the use of the IEEE 802.11 standard (col. 1, lines 66-67, col. 2, lines 1-5, col. 7, lines 30-44). However, the IEEE 802.11 standard utilizes 52 sub-channels as evidenced by Goldstein (¶ 0005). Therefore, it would have been obvious to one having ordinary skill in the art at the time which the invention was made that the OFDM communication system of Logvinov in view of Dollard would utilize 52 sub-carriers as specified by the IEEE 802.11 standard and disclosed by Goldstein.

#### **(10) Response to Argument**

With respect to claim 1, the Applicant argues that the prior art combination of Logvinov in view of Dollard fails to disclose "generating a pilot mask for immediate data communication use in the receiver ***based solely on analysis at the receiver***". Specifically, the Applicant suggests that Dollard's pilot mask of usable subcarriers for communication is generated ***jointly*** among a first communication device C1 and second

communication device C2. The Applicant relies, generally, on figure 3 of Dollard which illustrates the generation of a mask of usable subcarriers (fig. 3, ref. 54) at the side of the first communications device C1 which is transmitted (fig. 3, ref. 56) to the second communications device C2 and the further generation of a mask of a usable subcarriers (fig. 3, ref. 64) at the second communications device which is transmitted to the first communications device (fig. 3, ref. 66). The Applicant interprets Dollards determination of usable subcarriers (i.e. "the pilot mask" or "bitmap"; col. 7, lines 30-40) at C1 (fig. 3, ref. 54) and C2 (fig. 3, ref. 64) to be a mutual or combined process and not based solely on an analysis at the receiver (i.e. only at C1).

However, the Applicant's review of the prior art reference Dollard fails to take into account that the determination of usable subcarriers for the first communications device C1 and the determination of usable subcarriers for at the second communications device C2 are mutually exclusive events performed independently at steps 54 and 64 and do not depend upon each other. Each determination of usable subcarriers for either C1 or C2 is based solely on analysis performed at C1 or C2 respectively. Dollard discloses that unusable subcarriers of C1 are those which are unsuitable due to interference in proximity to C1 (col. 7, lines 10-15). Likewise, unusable subcarriers of C2 are those subcarriers which are *unsuitable due to interference in proximity to C2* (col. 8, lines 15-20). Each communications device C1 and C2 of Dollard is ready for immediate data communication only upon determining which subcarriers are unsuitable in their own respective proximities.

Dollard's disclosure comports with the common understanding that, at their respective sides, C1 and C2 could only be concerned with what subcarriers are usable or unusable *for reception*. Neither C1 nor C2 is concerned with what subcarriers are usable or unusable for transmission because transmission is not dependent upon any interference present. Particularly, in Dollard's OFDM communications method (col. 1, lines 25-50), the subcarriers usable *for reception* at C1 and those usable *for reception* at C2 are mutually exclusive and determined only at the side of each respective device based solely on an analysis at such device. The Examiner interprets Dollard reasonably that, upon determining which subcarriers are usable for reception at either the side of C1 or C2, each is ready for immediate data communication. Therefore, when the determination of the usable subcarriers for C1 is completed (i.e. at step 54) the generation of a pilot mask for immediate data communication use in the receiver (i.e. C1) ***based solely on analysis at the receiver*** is completed. Specifically, the pilot mask of usable subcarriers transmitted from C1 to C2 *is available for immediate use* by C2 to represent the applicable or usable subcarriers to be used to transmit from C2 for reception by C1. The fact that Dollard further discloses the determination of useable subcarriers at C2 (i.e. fig. 3, ref. 64) simply embodies a generation of a set of subcarriers to be used by C1 to transmit to C2. That is, Dollard's steps 54 and 64 of figure 3 operate exclusively for either own respective sides. In essence, Dollard discloses two halves of a two-way communications embodiment while the instant application claims only one half.



The Applicant attempts to distinguish Dollard from the instant application based on the fact that Dollard inter-mingles the pilot mask of two halves (i.e. C1 and C2) of a two-way communications embodiment (col. 8, lines 23-35). However, the fact that Dollard's disclosure provides inter-mingling of two independent analysis steps each based solely on an analysis at a respective device C1 or C2 does not make the instant application unobvious over the instant application. It would have been obvious to one having ordinary skill in the art at the time which the invention was made that the determination of Dollard's unusable subcarriers at C2 could be omitted while the remainder of Dollard's disclosure remained exactly the same.

Moreover and most importantly, it is noted by the Examiner that Dollard is a teaching reference to Logvinov. The Applicant erroneously concludes that one skilled in the art would automatically apply *the entirety* of Dollard to modify Logvinov. However, the combination of references applied by the Examiner never suggested as much. Rather, taking into consideration the exclusiveness of the generation of the pilot mask or bit map of each of Dollard's communication devices C1 and C2 as outlined above, it would have been obvious to incorporate only one half of Dollard's full embodiment to arrive precisely at the claimed invention. The combination of the references in such a manner is well within the ability of one having ordinary skill in the art and would produce an operable combination with only expected, predictable results.

#### **(11) Related Proceeding(s) Appendix**

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/Jason M Perilla/

Art Unit 2611  
October 8, 2008

Conferees:

/Chieh M Fan/

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